

MAR 23 1994



March 22, 1994

Mr. Chuck Schwer
Vermont Department of Environmental Conservation
Hazardous Materials Management Division
103 South Main St.
Waterbury, VT 05676

RE: Petroleum Contamination at Keith's Trading Post, Pittsford, Vermont
(VTDEC Site #93-1392)

Dear Mr. Schwer:

Enclosed please find the *Report on the Investigation of Subsurface Petroleum Contamination* at Keith's Trading Post in Pittsford, Vermont. This work was requested by the VTDEC in a letter from yourself to Mr. Dennis Boise of Champlain Oil Company dated June 29, 1993, and has been conducted in accordance with the July 1993 *Site Assessment Work Plan and Cost Estimate* for this site.

Please do not hesitate to call, should you have any questions regarding the contents of the report.

Sincerely,

A handwritten signature in cursive script, reading "Kristen Underwood". The signature is written in dark ink and is positioned above the printed name and title.

Kristen Underwood
Hydrogeologist

cc: Mr. D. Boise, COCO
GI #7934401

Encl.

MAR 23 1994

**REPORT ON THE
INVESTIGATION OF SUBSURFACE
PETROLEUM CONTAMINATION**

AT

**KEITH'S TRADING POST,
PITTSFORD, VERMONT**

**VTDEC SITE #93-1392
GRIFFIN PROJECT #7934401**

MARCH 1994

Prepared For:

Champlain Oil Company
P.O. Box 2126
South Burlington, VT 05403

Prepared By:

GRIFFIN INTERNATIONAL, INC.
2B Dorset Lane
Williston, Vermont 05495
(802) 879-7708

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I. INTRODUCTION

This report provides a summary of the tasks completed for the preliminary investigation of suspected subsurface petroleum contamination at Keith's Trading Post in Pittsford, Vermont (see Site Location Map in Appendix A). This work was conducted by Griffin International, Inc. (Griffin) for Champlain Oil Company (COCO) of South Burlington, Vermont, and for Mr. Joseph Keith, owner of Keith's Trading Post. This report presents results of groundwater sampling and analyses; a determination of groundwater flow direction and gradient; organic vapor survey results; a site survey; and an assessment of sensitive receptors in the vicinity of the Kingsbury site. Pertinent conclusions and recommendations for further investigation are also provided. This work was conducted at the request of the Vermont Department of Environmental Conservation (VTDEC) as presented in a letter from Mr. Chuck Schwer to Mr. Dennis Boise of COCO dated June 29, 1993. Except where noted, work was conducted in accordance with the July 1993 *Site Assessment Work Plan and Cost Estimate* (Work Plan) for this site.

II. SITE BACKGROUND

Keith's Trading Post is located in the Town of Pittsford on the southwest side of Route 7 on the corner of Depot Street and U.S. Route 7. Keith's Trading Post is located approximately 3200 feet to the east of the northward-flowing Otter Creek. Ground surface is mostly level in the immediate vicinity of the store and slopes moderately from the store to the eastern edge of the Otter Creek river valley, located approximately 1200 feet to the west southwest and approximately 150 feet lower in elevation (see Site Location Map in Appendix A). Land use in the area of the site is predominantly residential and commercial. According to the Pittsford Town Clerk, Gordon Delong, the entire area surrounding the Keith's Trading Post is served by the municipal water system.

Six underground storage tanks (USTs) were removed from the site in May of 1993. Two gasoline USTs, formerly located off the north side of Keith's Trading Post, are owned by the Champlain Oil Company, of South Burlington, Vermont. Four USTs previously located off the east side of the building (one kerosene, two diesel, and two gasoline) are owned by Joseph Keith owner of Keith's Trading Post. During the excavation of the tanks, petroleum contaminated soils were evident in the pits for all six USTs. Approximately 150 cubic yards of petroleum-contaminated soils were stored off-site at Rowe's Gravel Pit in Pittsford. The soils were laid on and entirely surrounded by polyethylene. Eleven vapor points were installed in the vicinity of the new tanks at a screened depth of 14 feet, to permit monitoring of volatile organic hydrocarbons in soil gas.

Several years ago, COCO installed groundwater monitoring wells in the vicinity of the USTs at Keith's Trading Post to serve as an external monitoring system for leak detection. Eight of these wells currently exist and are constructed of two-inch PVC. In addition, four new four-inch PVC monitoring wells were installed, one on each end of the two recently installed USTs.

III. INVESTIGATIVE PROCEDURES

A. Determination of Groundwater Flow Direction

Eleven of the twelve accessible wells were located at the site on February 4, 1994. MW-7 was inaccessible, as it was buried under a significant mass of stockpiled snow and ice. The wells and other site features including the Keith's Trading Post building and pump islands were surveyed for inclusion on a detailed site map. In addition, the elevation of the top of casing of each accessible well was measured in relation to an arbitrary datum (top of casing elevation of MW-1) which was assigned an elevation of 100 feet. Depth to free phase product, if present, and depth to water were measured in each of the accessible on-site monitoring wells on February 4, 1994, prior to groundwater sampling. Results are tabulated as Liquid Level Monitoring Data in Appendix B. None of the eleven accessible wells contained free floating product. Measured depth to water was subtracted from the surveyed elevation of each well, to determine the water table elevation. Water table elevations were plotted on a site map to generate the Groundwater Contour Map presented in Appendix A. From this figure it can be seen that groundwater flow is directed to the northwest in the immediate vicinity of the site, in a direction which closely follows the topographic gradient. The average groundwater gradient is approximately 2.6 percent.

B. Groundwater Sampling and Analysis

As proposed in the Work Plan, groundwater samples were to be collected from five of the accessible monitoring wells: (MW-1, MW-3, MW-4, MW-5, and MW-7). However, as MW-7 was inaccessible, a sample was obtained instead from MW-2, one of the four four-inch wells installed around the new USTs. Groundwater samples were analyzed by EPA Method 8020. Quality control (QC) samples (trip blank, equipment blank, and duplicate sample) were also collected. Results are summarized in tabular form in Appendix C. Laboratory data sheets are also provided. Laboratory analyses of the trip blank, equipment blank, and duplicate samples indicated that adequate Quality Assurance/ Quality Control was maintained throughout sample collection and analyses.

No BTEX compounds or MTBE were detected above detection limits in MW-1, the upgradient well at the site. Significant levels of BTEX compounds and MTBE were detected in MW-2, MW-3, MW-4, and MW-5 located downgradient of the former USTs. Benzene, ethylbenzene, and toluene in MW-2, MW-3, MW-4, and MW-5 exceeded the respective EPA Maximum Contaminant Level (MCL) for these constituents. MTBE in MW-2, MW-3, and MW-4 exceeded the Vermont Health Advisory Level (HAL) for this constituent. Total xylenes in MW-4 exceeded the EPA MCL, and while total xylenes in MW-3 closely approached the 10,000 ppb EPA MCL, levels of this constituent in the duplicate sample taken from this well exceeded the MCL.

C. Soil Vapor Survey

The Work Plan called for a soil vapor survey of the site using a portable photoionization detector (PID). Monitored points were to include the eleven vapor monitoring points installed by COCO around the new USTs and ambient air in the Keith's Trading Post building. Due to thick ice and snow cover on the parking lot on February 4, 1994, none of the vapor monitoring points could be located. A second attempt will be made to locate these points and conduct a soil-gas survey in the Summer of 1994.

As time permitted, screening for volatile organics was conducted at the top of casing in select wells at the site using an HnuTM Model HW-101 Photoionization Detector (PID). The total concentration of volatile organic constituents (VOCs) was measured within the top of casing of the following wells, as noted.

<u>Monitoring Point</u>	<u>TVOCs (ppm)</u>
MW-2	1.1 ppm
MW-6	73 ppm
MW-8	146 ppm
MW-9	49 ppm

The above four wells are the four-inch PVC leak detection monitoring wells installed around the new USTs at the site. TVOC concentrations in MW-6, MW-8, and MW-9 were one to two orders of magnitude greater than TVOC concentration in MW-2. Subsequent water quality analysis of the groundwater sample collected from MW-2 indicated the presence of significantly elevated concentrations of BTEX constituents and MTBE. Thus, groundwater in MW-6, MW-8, and MW-9 may be expected to contain elevated concentrations of BTEX and MTBE, as well. Monitoring of these three wells for the possible presence of pure product would be warranted during the next scheduled groundwater sampling event.

D. Stockpiled Soil Screening

The Work Plan called for PID screening of contaminated soils which were generated as a result of the tank removals and which are now stockpiled on the Rowe's Gravel Pit property in Pittsford, Vermont. Soil samples were to be collected from the pile using a hand auger. Since the soils were frozen on the date of the site assessment, soil augering and PID screening were not attempted. PID screening of soils will be rescheduled for the Summer of 1994.

III. RECEPTOR SURVEY

The area surrounding Keith's Trading Post was evaluated during the site visit conducted on February 4, 1994, to identify potentially sensitive receptors in the vicinity of the site. The Keith's

Trading Post building was identified as the most likely potential receptor, although no elevated volatile organic vapors were detected in the building on February 4, 1994.

There are no groundwater supply wells or springs in use as a primary drinking water source in the immediate vicinity of Keith's Trading Post. A review of State files for this area, revealed records for two wells on properties located within one half mile to the northwest of the store. According to Mr. Joseph Keith, however, these two residences are currently served by municipal water supply.

Otter Creek is located approximately 3200 feet west of Keith's Trading Post. A wetlands area exists at the easternmost edge of the Otter Creek river valley approximately 1200 feet west of and 150 feet lower in elevation than Keith's Trading Post (see Site Location Map in Appendix A). This swampy area was monitored at its northernmost end where it could be accessed via Depot Hill Road. No elevated VOCs were detected with the PID. Water surfaces were largely covered with ice and snow.

A stormwater drain which collects runoff from properties to the east side of Route 7, north of Keith's Trading Post, passes under Route 7 and discharges water to the surface at a point located within approximately 200 feet southwest of Keith's Trading Post. This stormwater outlet was visually inspected on February 4, 1994, for signs of petroleum contamination such as iridescent sheens, stained soils, or petroleum odors, and the air immediately above the water surface was monitored with a PID. No elevated levels of volatile organic constituents or other signs of petroleum contamination were detected.

Buildings present on the site consist of the Keith's Trading Post store. No organic vapors were detected with the PID inside the building on February 4, 1994. Due to the absence of petroleum vapors inside the building, there appears to be negligible risk to the Keith's Trading Post building posed by petroleum releases to adjacent soils and groundwater. However, due to the relatively high concentrations of BTEX compounds and MTBE in the groundwater immediately adjacent to the north end of the building, continued monitoring of the building basement is warranted.

IV. CONCLUSIONS

Based upon the results of the above investigative tasks, Griffin presents the following conclusions:

- 1) Groundwater flow is directed to the northwest in the immediate vicinity of the site; the average groundwater gradient is approximately 2.6 percent.
- 2) Dissolved petroleum contamination was evident in four of the five on-site monitoring wells which were sampled. Concentrations of select BTEX compounds and MTBE in each of these four wells exceeded the respective EPA MCL or VT HAL.

- 3) The downgradient and lateral extents of dissolved petroleum contamination at the site are unknown.
- 4) No free phase product was detected in the sampled wells.
- 5) No BTEX compounds or MTBE were reported above detection limits in MW-1, the upgradient well at the site.
- 6) Due to extensive ice and snow cover on the day of the site assessment, eleven vapor monitoring points were not able to be located and the soil gas survey proposed in the Work Plan was not able to be conducted.
- 7) Vapor monitoring with a PID revealed the presence of elevated VOCs at the top of casing in wells, MW-6, MW-8, and MW-9.
- 8) Petroleum-contaminated soils from the site stockpiled at Rowe's Gravel Pit in Pittsford, Vermont, were frozen on the day of the site assessment; PID screening of these soils was not attempted.

V. RECOMMENDATIONS

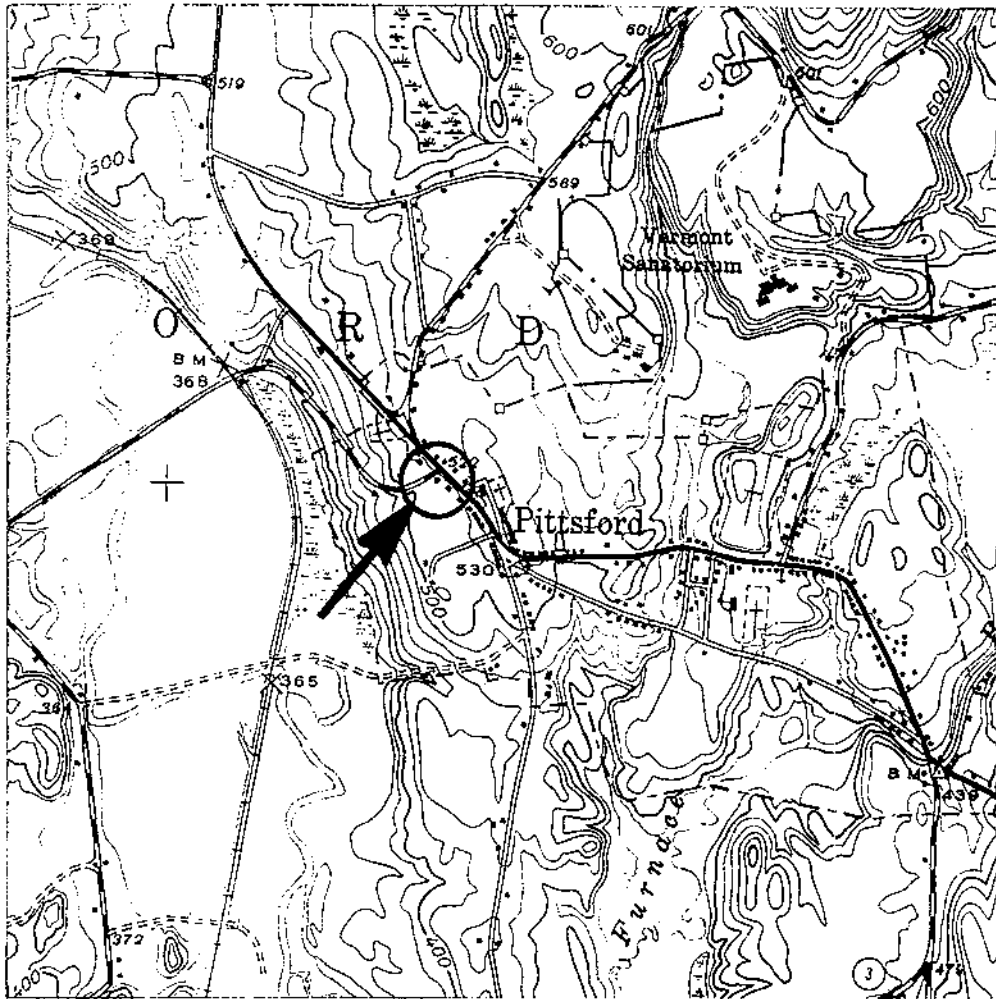
Based upon the above conclusions, Griffin recommends the following actions:

- 1) Groundwater from MW-2, MW-4, and MW-5 should be sampled again in July of 1994, and a sample should be collected from existing well, MW-10, to assist in defining the lateral extent of contamination in an eastern direction from the vicinity of the former USTs. Groundwater samples should be analyzed by EPA Method 8020 for the presence of BTEX compounds and MTBE.
- 2) All existing monitoring wells at the site should be monitored in July 1994 for measurements of the depth to water table to define the groundwater gradient and flow direction, and for the potential existence of pure product.
- 3) During the site visit conducted in July of 1994, stockpiled soils should be screened with a PID. Also, the eleven on-site vapor monitoring points should be located and screened with a PID to assess soil gas quality in the vicinity of the tanks.
- 4) Basement and ground floor ambient air quality in the Keith's Trading Post building should be screened with a PID during the July 1994 visit.
- 5) After receipt of the analytical results of July 1994 groundwater sample results, a decision regarding continued monitoring frequency can be made.

- 6) At least two soil borings should be installed to assist in determining the downgradient and lateral extents of dissolved petroleum constituent migration. One boring should be installed northwest of Keith's Trading Post on the north side of Depot Hill Road. A second boring should be placed west of Keith's Trading Post on the south side of Depot Hill Road. Soil borings would be advanced with a hand auger to the water table, and the saturated soils would be screened with a PID. If elevated VOCs were detected in a boring, a PVC monitoring well would then be installed in that approximate location using an auger rig.

APPENDIX A

Site Maps



JEB #: 7934401
SOURCE: USGS PROCTOR QUADRANGLE



KEITH'S TRADING POST

PITTSFORD, VERMONT

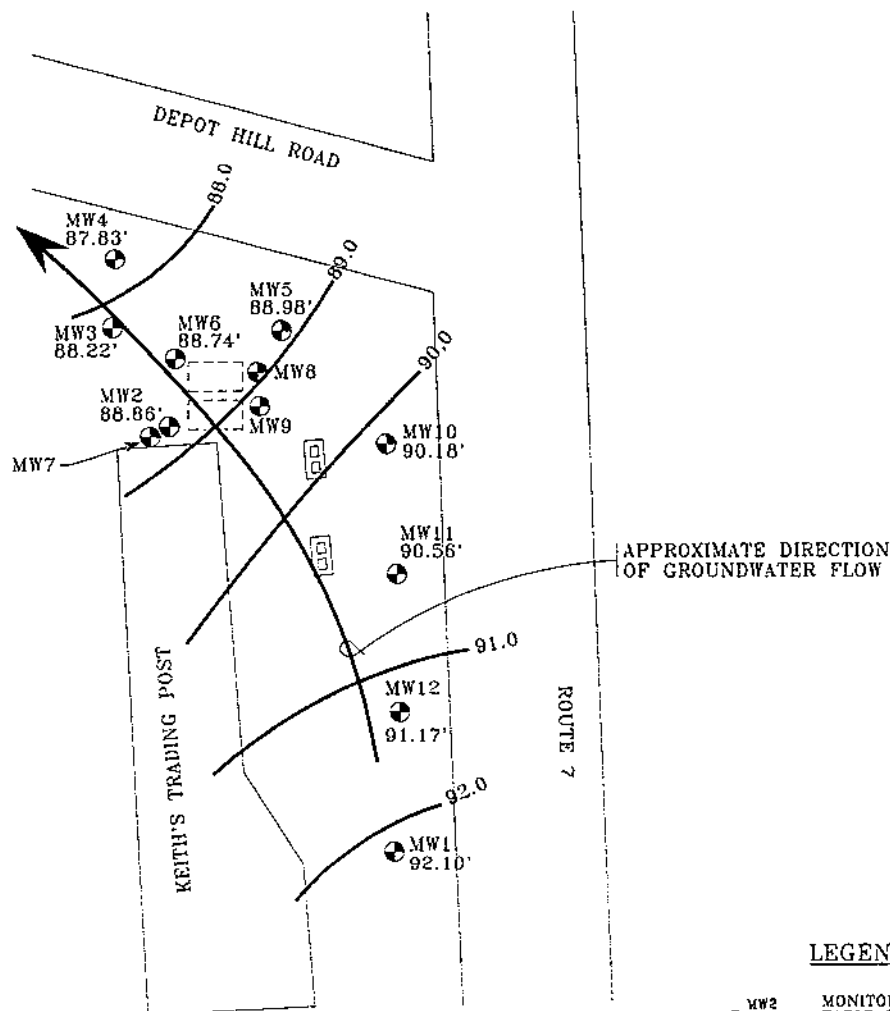
SITE LOCATION MAP

DATE: 2/7/94

DWG.#: 1

SCALE: 1:24000

DRN SB APP: KL



LEGEND

- MW2 88.86' MONITORING WELL AND WATER TABLE ELEVATION IN FEET
- 91.0 WATER TABLE ELEVATION IN FEET
- [] NEW UST'S
- [] PUMP ISLAND

JOB #: 7934401
DATE MEASURED: 2/4/94



KEITH'S TRADING POST

PITTSFORD,

VERMONT

GROUNDWATER CONTOUR MAP

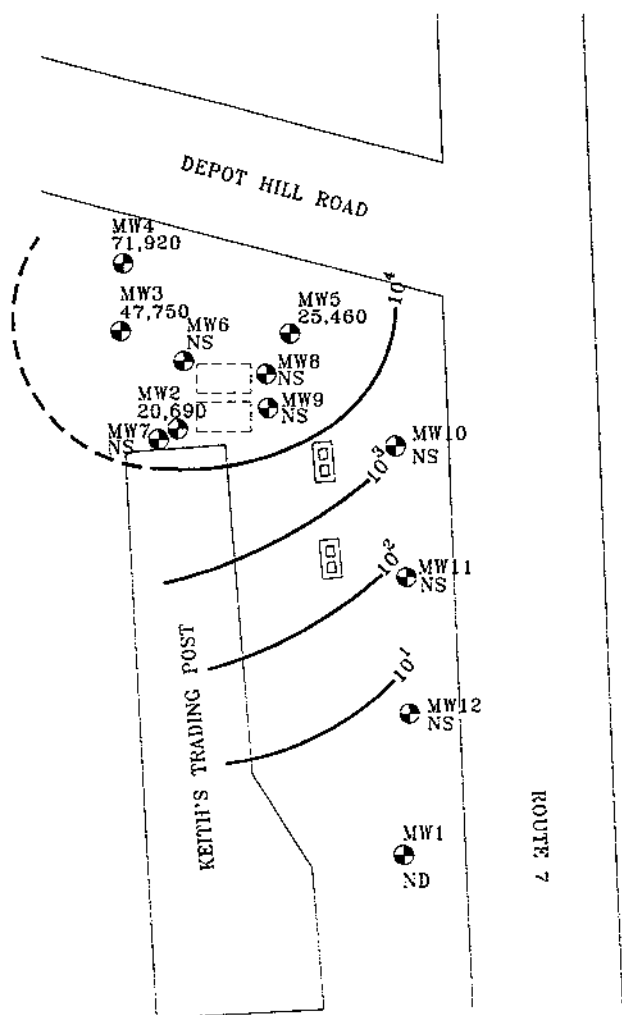
DATE: 2/7/94

DWG.# 3

SCALE: 1"=50'

DRN: SB

APP: KJ



LEGEND

MW2 20,690 MONITORING WELL AND TOTAL BTEX AND MTBE CONCENTRATION (ppb)

ISOCONCENTRATION CONTOUR - TOTAL BTEX AND MTBE (ppb) (DASHED WHERE INFERRED)

NEW UST'S

PUMP ISLAND

JOB #: 7934401
DATE SAMPLED: 2/4/94



KEITH'S TRADING POST

PITTSFORD,

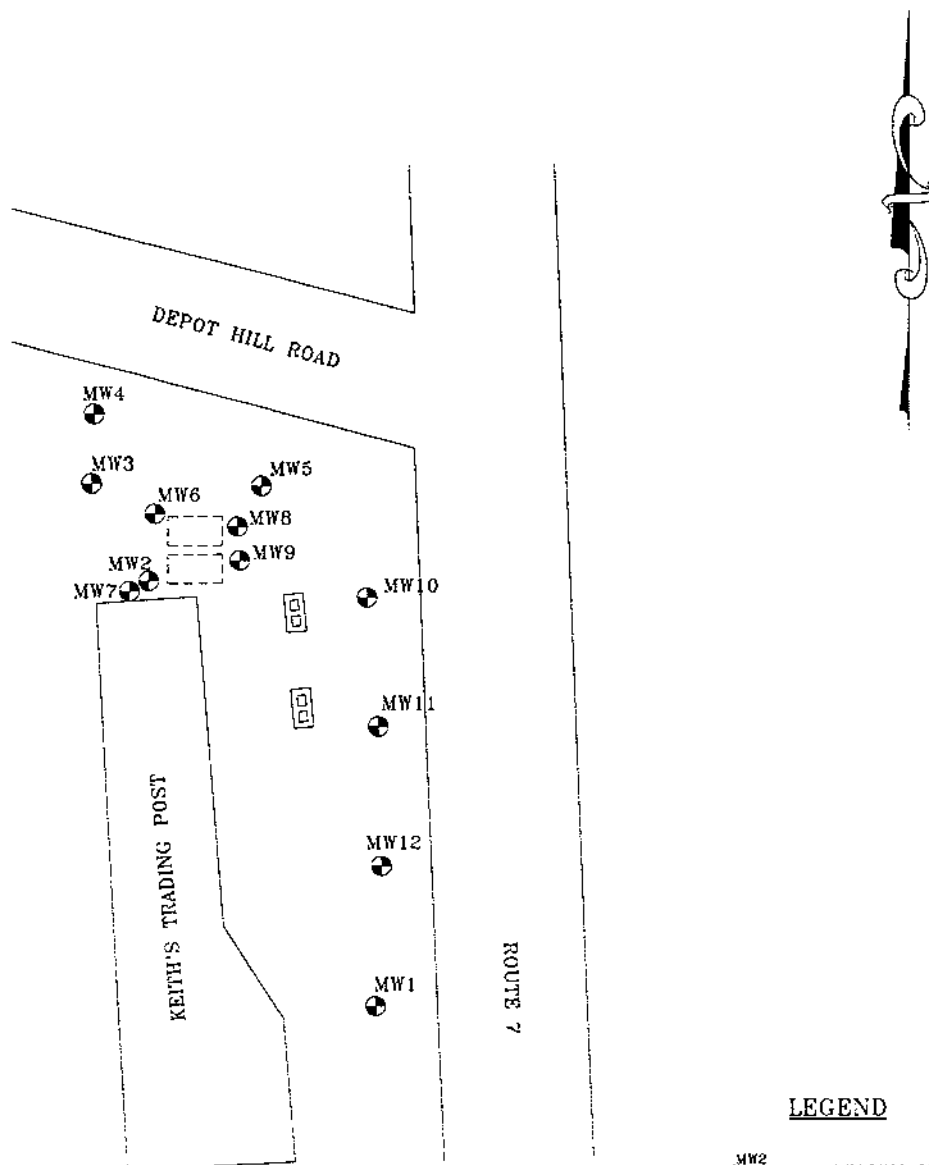
VERMONT

CONTAMINANT DISTRIBUTION MAP
TOTAL DISSOLVED BTEX AND MTBE (ppb)

DATE: 2/7/94

DWG.#: 4

SCALE: 1"=50' DRN: SB APP: KU



JOB #: 7934401



KEITH'S TRADING POST

PITTSFORD,

VERMONT

SITE MAP

DATE: 2/7/94

DWG.#: 2

SCALE 1"=50'

DRN: SB

APP: KJ

APPENDIX B

Liquid Level Data

**Liquid Level Monitoring Data
Keith's Trading Post
Pittsford, Vermont**

Monitoring Date: February 4, 1994

Well I.D.	Well Depth (ft)	Top of Casing Elevation (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Specific Gravity of Product	Hydro Equivalent (ft)	Corrected Depth To Water (ft)	Corrected Water Table Elevation (ft)
MW-1	-	100.00	-	7.90	-	-	-	-	92.10
MW-2	-	96.82	-	7.96	-	-	-	-	88.86
MW-3	-	94.84	-	6.62	-	-	-	-	88.22
MW-4	-	93.44	-	5.61	-	-	-	-	87.83
MW-5	-	95.19	-	6.21	-	-	-	-	88.98
MW-6	-	95.40	-	6.66	-	-	-	-	88.74
MW-7	-	NM	-	NM	-	-	-	-	NM
MW-8	-	96.59	-	NM	-	-	-	-	NM
MW-9	-	96.85	-	NM	-	-	-	-	NM
MW-10	-	96.93	-	6.75	-	-	-	-	90.18
MW-11	-	97.82	-	7.26	-	-	-	-	90.56
MW-12	-	98.94	-	7.77	-	-	-	-	91.17

NM - Not Measured

APPENDIX C
Groundwater Quality Data

Groundwater Quality Summary
Keith's Trading Post
Pittsford, Vermont

Sample Collection Date: February 4, 1994

PARAMETER	MW-1	MW-2	MW-3	MW-4	MW-5	Quality Control Samples			Drinking Water Standards
						Trip Blank	Equipment Blank	Duplicate (MW-3)	
Benzene	ND	2,430.	12,400.	18,000.	2,620.	ND	ND	13,700.	5.0 *
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	100 *
1,2-DCB	ND	ND	ND	ND	ND	ND	ND	ND	600 *
1,3-DCB	ND	ND	ND	ND	ND	ND	ND	ND	600 **
1,4-DCB	ND	ND	ND	ND	ND	ND	ND	ND	75 *
Ethylbenzene	ND	2,090.	1,470.	2,720.	1,720.	ND	ND	1,610.	700 *
Toluene	ND	4,230.	20,100.	27,000.	12,300.	ND	ND	22,200.	1,000 *
Xylenes	ND	8,480.	9,760.	14,000.	8,820.	ND	ND	10,700.	10,000 *
Total BTEX	ND	17,230.	43,730.	61,720.	25,460.	ND	ND	48,210.	-
MTBE	ND	3,460.	4,020.	10,200.	ND	ND	ND	4,260.	40 **
BTEX+MTBE	ND	20,690.	47,750.	71,920.	25,460.	ND	ND	52,470.	-

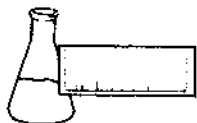
ND - None Detected

* = EPA Maximum Contaminant Level

** = VT Health Advisory Level

*** = Proposed EPA Maximum Contaminant Level

- = None available



ENDYNE, INC.

RECEIVED FEB 18 1994

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

REPORT OF LABORATORY ANALYSIS

CLIENT: Griffin International
PROJECT NAME: Keith's Trading Post
REPORT DATE: February 15, 1994
DATE SAMPLED: February 7, 1994

PROJECT CODE: GIKT1798
REF.#: 56,327 - 56,334

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. Chain of custody indicated samples were preserved with HCl.

All samples were prepared and analyzed by requirements outlined in the referenced method and within the specified holding times. All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced method. Blank contamination was not observed at levels affecting the analytical results.

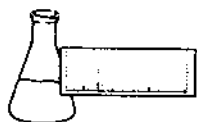
Analytical method precision and accuracy was monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Individual sample performance was monitored by the addition of surrogate analytes to each sample. All surrogate recovery data was determined to be within laboratory QA/QC guidelines unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures



ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020--PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Keith's Trading Post
REPORT DATE: February 15, 1994
DATE SAMPLED: February 7, 1994
DATE RECEIVED: February 7, 1994
ANALYSIS DATE: February 8, 1994

PROJECT CODE: GIKT1798
REF.#: 56,327
STATION: Trip Blank
TIME SAMPLED: 13:30
SAMPLER: D. Tourangeau/K. Underwood

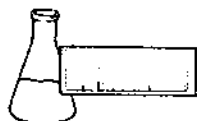
<u>Parameter</u>	<u>Detection Limit (ug/L)</u>	<u>Concentration (ug/L)</u>
Benzene	1	ND ¹
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	10	ND

Bromobenzene Surrogate Recovery: 114%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 None detected



ENDYNE, INC.

Laboratory Services

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LABORATORY REPORT

EPA METHOD 8020--PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Keith's Trading Post
REPORT DATE: February 15, 1994
DATE SAMPLED: February 7, 1994
DATE RECEIVED: February 7, 1994
ANALYSIS DATE: February 8, 1994

PROJECT CODE: GIKT1798
REF.#: 56,328
STATION: MW-1
TIME SAMPLED: 13:45
SAMPLER: D. Tourangeau/K. Underwood

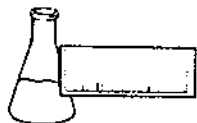
<u>Parameter</u>	<u>Detection Limit (ug/L)</u>	<u>Concentration (ug/L)</u>
Benzene	1	ND ¹
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	10	ND

Bromobenzene Surrogate Recovery: 110%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 None detected



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LABORATORY REPORT

EPA METHOD 8020--PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Keith's Trading Post
REPORT DATE: February 15, 1994
DATE SAMPLED: February 7, 1994
DATE RECEIVED: February 7, 1994
ANALYSIS DATE: February 8, 1994

PROJECT CODE: GIKT1798
REF.#: 56,329
STATION: MW-2
TIME SAMPLED: 13:35
SAMPLER: D. Tourangeau/K. Underwood

<u>Parameter</u>	<u>Detection Limit (ug/L)¹</u>	<u>Concentration (ug/L)</u>
Benzene	20	2,430.
Chlorobenzene	20	ND ²
1,2-Dichlorobenzene	20	ND
1,3-Dichlorobenzene	20	ND
1,4-Dichlorobenzene	20	ND
Ethylbenzene	20	2,090.
Toluene	20	4,230.
Xylenes	20	8,480.
MTBE	200	3,460.

Bromobenzene Surrogate Recovery: 115%

NUMBER OF UNIDENTIFIED PEAKS FOUND: >10

NOTES:

1 Detection limit raised due to high levels of contaminants. Sample run at 5% dilution.

2 None detected



ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020--PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Keith's Trading Post
REPORT DATE: February 15, 1994
DATE SAMPLED: February 7, 1994
DATE RECEIVED: February 7, 1994
ANALYSIS DATE: February 9, 1994

PROJECT CODE: GIKT1798
REF.#: 56,330
STATION: MW-3
TIME SAMPLED: 14:10
SAMPLER: D. Tourangeau/K. Underwood

<u>Parameter</u>	<u>Detection Limit (ug/L)¹</u>	<u>Concentration (ug/L)</u>
Benzene	100	12,400.
Chlorobenzene	100	ND ²
1,2-Dichlorobenzene	100	ND
1,3-Dichlorobenzene	100	ND
1,4-Dichlorobenzene	100	ND
Ethylbenzene	100	1,470.
Toluene	100	20,100.
Xylenes	100	9,760.
MTBE	1000	4,020.

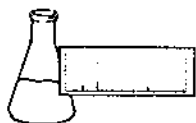
Bromobenzene Surrogate Recovery: 103%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 10

NOTES:

1 Detection limit raised due to high levels of contaminants. Sample run at 1% dilution.

2 None detected



ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020--PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Keith's Trading Post
REPORT DATE: February 15, 1994
DATE SAMPLED: February 7, 1994
DATE RECEIVED: February 7, 1994
ANALYSIS DATE: February 9, 1994

PROJECT CODE: GIKT1798
REF.#: 56,331
STATION: MW-4
TIME SAMPLED: 15:00
SAMPLER: D. Tourangeau/K. Underwood

<u>Parameter</u>	<u>Detection Limit (ug/L)¹</u>	<u>Concentration (ug/L)</u>
Benzene	200	18,000.
Chlorobenzene	200	ND ²
1,2-Dichlorobenzene	200	ND
1,3-Dichlorobenzene	200	ND
1,4-Dichlorobenzene	200	ND
Ethylbenzene	200	2,720.
Toluene	200	27,000.
Xylenes	200	14,000.
MTBE	2000	10,200.

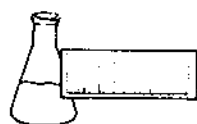
Bromobenzene Surrogate Recovery: 104%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 10

NOTES:

1 Detection limit raised due to high levels of contaminants. Sample run at 0.5% dilution.

2 None detected



ENDYNE, INC.

Laboratory Services

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Williston, Vermont 05495
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FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020--PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Keith's Trading Post
REPORT DATE: February 15, 1994
DATE SAMPLED: February 7, 1994
DATE RECEIVED: February 7, 1994
ANALYSIS DATE: February 9, 1994

PROJECT CODE: GIKT1798
REF.#: 56,332
STATION: MW-5
TIME SAMPLED: 14:35
SAMPLER: D. Tourangeau/K. Underwood

<u>Parameter</u>	<u>Detection Limit (ug/L)¹</u>	<u>Concentration (ug/L)</u>
Benzene	100	2,620.
Chlorobenzene	100	ND ²
1,2-Dichlorobenzene	100	ND
1,3-Dichlorobenzene	100	ND
1,4-Dichlorobenzene	100	ND
Ethylbenzene	100	1,720.
Toluene	100	12,300.
Xylenes	100	8,820.
MTBE	1000	ND

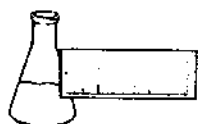
Bromobenzene Surrogate Recovery: 108%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 6

NOTES:

1 Detection limit raised due to high levels of contaminants. Sample run at 1% dilution.

2 None detected



ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
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LABORATORY REPORT

EPA METHOD 8020--PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Keith's Trading Post
REPORT DATE: February 15, 1994
DATE SAMPLED: February 7, 1994
DATE RECEIVED: February 7, 1994
ANALYSIS DATE: February 9, 1994

PROJECT CODE: GIKT1798
REF.#: 56,333
STATION: MW-3 (Dup)
TIME SAMPLED: 14:10
SAMPLER: D. Tourangeau/K. Underwood

<u>Parameter</u>	<u>Detection Limit (ug/L)¹</u>	<u>Concentration (ug/L)</u>
Benzene	100	13,700.
Chlorobenzene	100	ND ²
1,2-Dichlorobenzene	100	ND
1,3-Dichlorobenzene	100	ND
1,4-Dichlorobenzene	100	ND
Ethylbenzene	100	1,610.
Toluene	100	22,200.
Xylenes	100	10,700.
MTBE	1000	4,260.

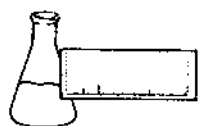
Bromobenzene Surrogate Recovery: 112%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 10

NOTES:

1 Detection limit raised due to high levels of contaminants. Sample run at 1% dilution.

2 None detected



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LABORATORY REPORT

EPA METHOD 8020--PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Keith's Trading Post
REPORT DATE: February 15, 1994
DATE SAMPLED: February 7, 1994
DATE RECEIVED: February 7, 1994
ANALYSIS DATE: February 9, 1994

PROJECT CODE: GIKT1798
REF.#: 56,334
STATION: Field Blank
TIME SAMPLED: 15:06
SAMPLER: D. Tourangeau/K. Underwood

<u>Parameter</u>	<u>Detection Limit (ug/L)</u>	<u>Concentration (ug/L)</u>
Benzene	1	ND ¹
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	10	ND

Bromobenzene Surrogate Recovery: 109%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 None detected



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EPA METHOD 8020 LABORATORY REPORT

MATRIX SPIKE AND DUPLICATE LABORATORY CONTROL DATA

CLIENT: Griffin International
PROJECT NAME: Keith's Trading Post
REPORT DATE: February 15, 1994
DATE SAMPLED: February 7, 1994
DATE RECEIVED: February 7, 1994
ANALYSIS DATE: February 8, 1994

PROJECT CODE: GIKT1798
REF.#: 56,328
STATION: MW-1
TIME SAMPLED: 13:45
SAMPLER: D. Tourangeau/K. Underwood

<u>Parameter</u>	<u>Sample(ug/L)</u>	<u>Spike(ug/L)</u>	<u>Dup1(ug/L)</u>	<u>Dup2(ug/L)</u>	<u>Avg % Rec</u>
Benzene	ND ¹	10	10.9	11.1	110%
Toluene	ND	10	10.4	10.1	103%
Ethylbenzene	ND	10	9.8	9.7	98%
Xylenes	ND	30	29.4	29.3	98%

NOTES:

1 None detected



CHAIN-OF-CUSTODY RECORD

09342

Project Name: <i>Kochis Tract, Port</i> Site Location: <i>P. H. Ford, VT</i>	Reporting Address: <i>Giffen International</i> <i>2 B Dunsell Lane</i> <i>Wilton, VT</i>	Billing Address: <i>same</i>
Endyne Project Number: <i>G. KT1798</i>	Company: <i>Robert Henderson</i> Contact Name/Phone #: <i>879 7768</i>	Sampler Name: <i>D. Tourangeau</i> Phone #: <i>879 7768</i>

[illegible]

Relinquished by: Signature <i>Kristen W. Underwood</i>	Received by: Signature	Date/Time 2-7-14 08:10
Relinquished by: Signature	Received by: Signature <i>JM Withmore</i>	Date/Time 2/7/14 8:16 AM

Requested Analyses

Requested Analysis											
1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD ₅	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCMP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										